

BlackSwan, LLC Patent Pending Technologies for Energy Carbon Management

- **Membrane Direct Air Capture (MDAC™)**- Simplest, lowest cost carbon management solution **that captures and mildly concentrates** and **delivers CO2 directly from air** (not reliant on stationary or mobile source of CO2) at a suitable level **for Crop Carbon Enrichment™** **for increase up to 100% crop yield and 20% water utilization efficiency, and biosequestration** and also produces a CO2 depleted air stream.
 - Status: pilot and bench scale operating 3 years, similar to industrial scale demo facility operating since 2010
- **Membrane Capture Concentration and Sequestration (MCCS™)**- Most efficient/ sustainable carbon management solution for **capture and intermediate or high concentration** of CO2 **directly from air, reduces fuel consumption and size of flue gas** generators, with **sequestration** such as in Enhanced Oil Recovery, or biosequestration and also produces a CO2 depleted air stream.
 - Status: pilot and bench scale operating 3 years, similar to industrial scale demo facility operating since 2010
- **Flue Gas Extraction and Biosequestration (FGXB™)**- Profitably **captures by extraction/ conditioning** flue gas, then **dilutes and delivers** a CO2 product suitable for **Crop Carbon Enrichment and biosequestration**.
 - Status: R&D, pilot, and bench scale operating 3 years, industrial scale demo plant CCI/CARB/CDFA SWEEP funded under construction
- **Membrane Flue gas Concentration and Biosequestration (MFCB™)**- **Extracts, conditions, and performs intermediate concentration for transport, then dilution** of CO2 from flue gas for **biosequestration**
 - Status: R&D
- **Liquid CO2 Extraction and Biosequestration (LCXB™)**- **Extracts, conditions, dilutes, and delivers from a highly concentrated CO2 source (eg. pipeline) for biosequestration**.
 - Status: R&D, pilot and bench scale operating 3 years, industrial scale proposal pending

OWNER: Brian Kolodji, PE email: bkolodji@sbcglobal.net; cell: (713) 907-8742; Office: (661) 742-1659, Bakersfield, California